Danggali Wilderness Protection Area and Conservation Park

Management Plan 2011

Working with partners to conserve wilderness quality and deliver landscape scale biodiversity outcomes within a highly connected landscape.

Department of Environment and Natural Resources

Government of South Australia

www.environment.sa.gov.au

Minister's foreword

Danggali Wilderness Protection Area and Danggali Conservation Park protect an extensive tract of high quality mallee wilderness, including core habitat for a range of threatened and declining species.

Several neighbouring properties are managed primarily for conservation purposes, creating an exciting opportunity for collaboration on landscape scale biodiversity initiatives.

In recognising these values, the plan identifies biodiversity and wilderness conservation as the primary management focus for the future. This approach does not restrict use and enjoyment of the reserves by the public. It merely promotes a more self-sufficient, low impact ethos.

Reserve planning is undergoing a process of change; central to this change is a need to establish realistic and achievable management goals for our reserves. Management plans are no longer an exhaustive list of strategies; they are smarter, more strategic and priority focused.

The local community has played an important role in developing this plan, providing ideas and feedback at different stages of the process. I urge the community to continue taking ownership of these reserves, and to work with Government in delivering the identified management strategies.

I now formally adopt this management plan for the Danggali Wilderness Protection Area and Danggali Conservation Park under the provisions of section 31 of the *Wilderness Protection Act 1992* and section 38 of the *National Parks and Wildlife Act 1972*.

The Hon Paul Caica MP
Minister for Sustainability,
Environment and Conservation

Directions for management

Danggali Wilderness Protection Area and Danggali Conservation Park protect an extensive, highly connected and largely unmodified area of mallee habitat. The reserves are valued for their wilderness quality and contribution to regional biodiversity conservation.

The Management Plan for Danggali Wilderness Protection Area and Danggali Conservation Park sets directions for management of the reserves and was prepared in consultation with technical experts and members of the local community. Through this process a shared vision has been identified and management strategies established. How these strategies are prioritised, implemented and delivered is coordinated by the Department of Environment and Natural Resources on an annual basis.

This management plan meets the requirements of section 38 of the *National Parks and Wildlife Act* 1972 and section 31 of the *Wilderness Protection Act* 1992.

Park significance and purpose

Conservation begins with understanding what we are protecting.

The Danggali reserves protect over 250 000 hectares of high quality mallee vegetation, providing habitat for species and ecosystems of conservation significance. Located 70 kilometres north of Renmark (Figure 1) in the South Australian Murraylands Region, the reserves include:

- Danggali Wilderness Protection Area (202, 815 hectares)
- Danggali Conservation Park (48, 417 hectares)

Danggali Conservation Park was originally proclaimed in 1976. Following a formal assessment by the South Australian Wilderness Advisory Committee in 2005, the northern section of the reserve was recommended for protection under the *Wilderness Protection Act 1992*. The Danggali Wilderness Protection Area was subsequently proclaimed in 2009.

Characterised by undulating calcrete plains with easterly trending dunes and occasional claypans, the vegetation within the reserves is dominated by Eucalyptus mallee woodland and forest, with a Triodia *(Triodia spp)* understorey. Extensive Casuarina *(Casuarina pauper)* woodlands are also found to the south-east.

Relicts of early pastoral activity.

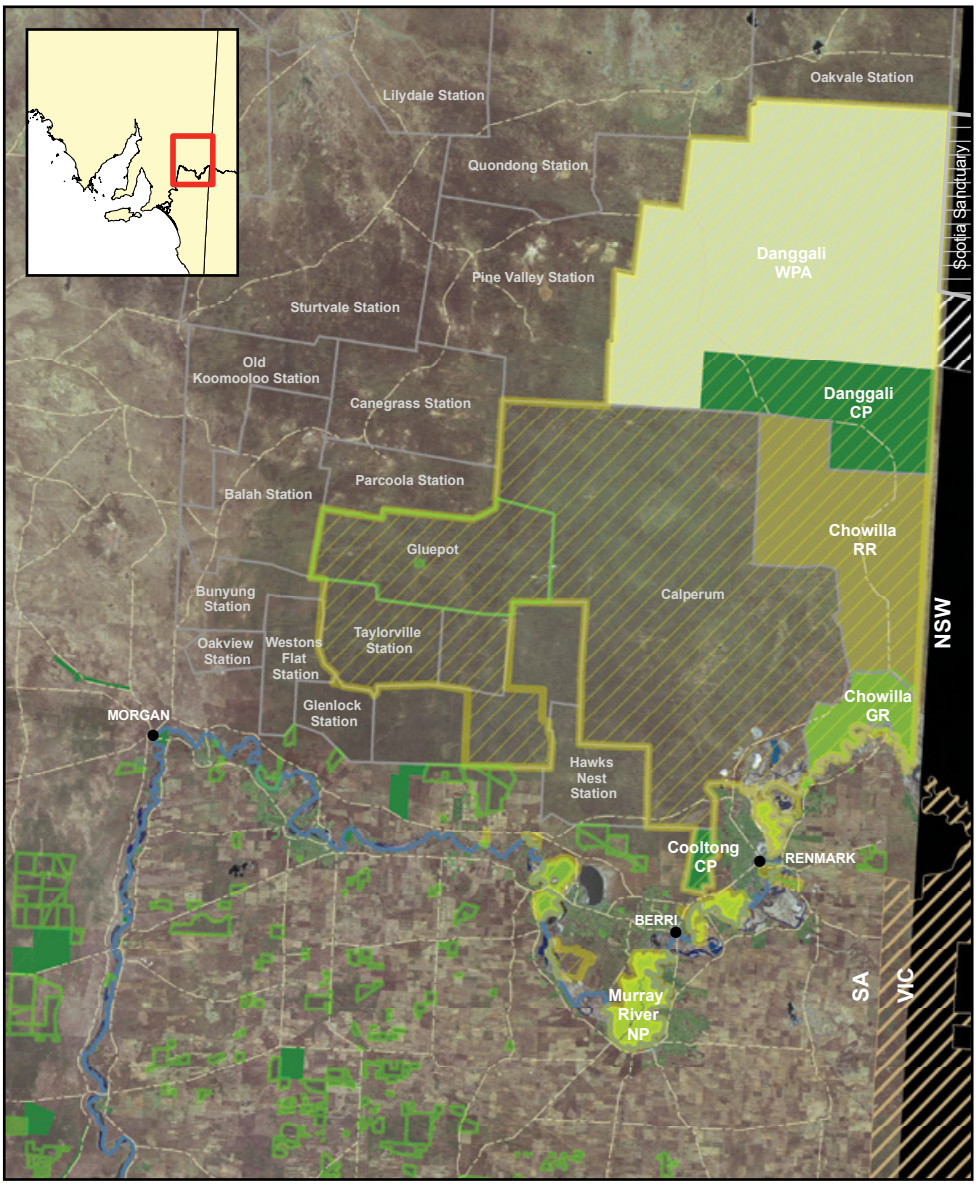

Figure 1: *Location map.*

Forming a core component of the larger Riverland Biosphere Reserve (formerly Bookmark Biosphere), the reserves are considered a key biodiversity area due to the diverse range of plant and animal species they support. This extensive, highly connected and largely unmodified environment provides a significant refuge for mallee biodiversity.

Historic and cultural values are also conserved. Evidence of early pastoral activities in the district can be found throughout the reserves, including the Canopus and Morganvale Homesteads. Nanya's Wurley stands as a relic of Aboriginal occupation within the region.

The reserves are popular with self-sufficient travellers and an important resource for ecological research programs.

There is currently no native title claim over either of the reserves.

The value of wilderness

Wilderness is defined as land which has not been seriously affected by modern technology or exotic plants, animals and organisms (DEH, 2008).

These areas are a critically important resource for the long-term protection of biological diversity and self-sustaining ecosystems, particularly in the face of climate change. Wilderness areas also offer unique opportunities to enjoy solitude in pristine natural environments.

As the climate changes, our natural systems are likely to become more susceptible to broad scale pressures such as increased bushfire intensity and frequency, and the spread of weeds and feral animals.

Large, intact wilderness areas are critical in providing a buffer against these disturbances and ultimately reducing species extinction.

The reserves support one of the largest tracts of high wilderness quality mallee vegetation in the southern pastoral zone. Although early pastoral grazing activities have resulted in varying degrees of vegetation disturbance within the reserves, the area has remained relatively intact.

Development has been limited, with infrastructure restricted to a network of access tracks, fencing, waterpoints and pastoral buildings.

Major Mitchell Cockatoos.

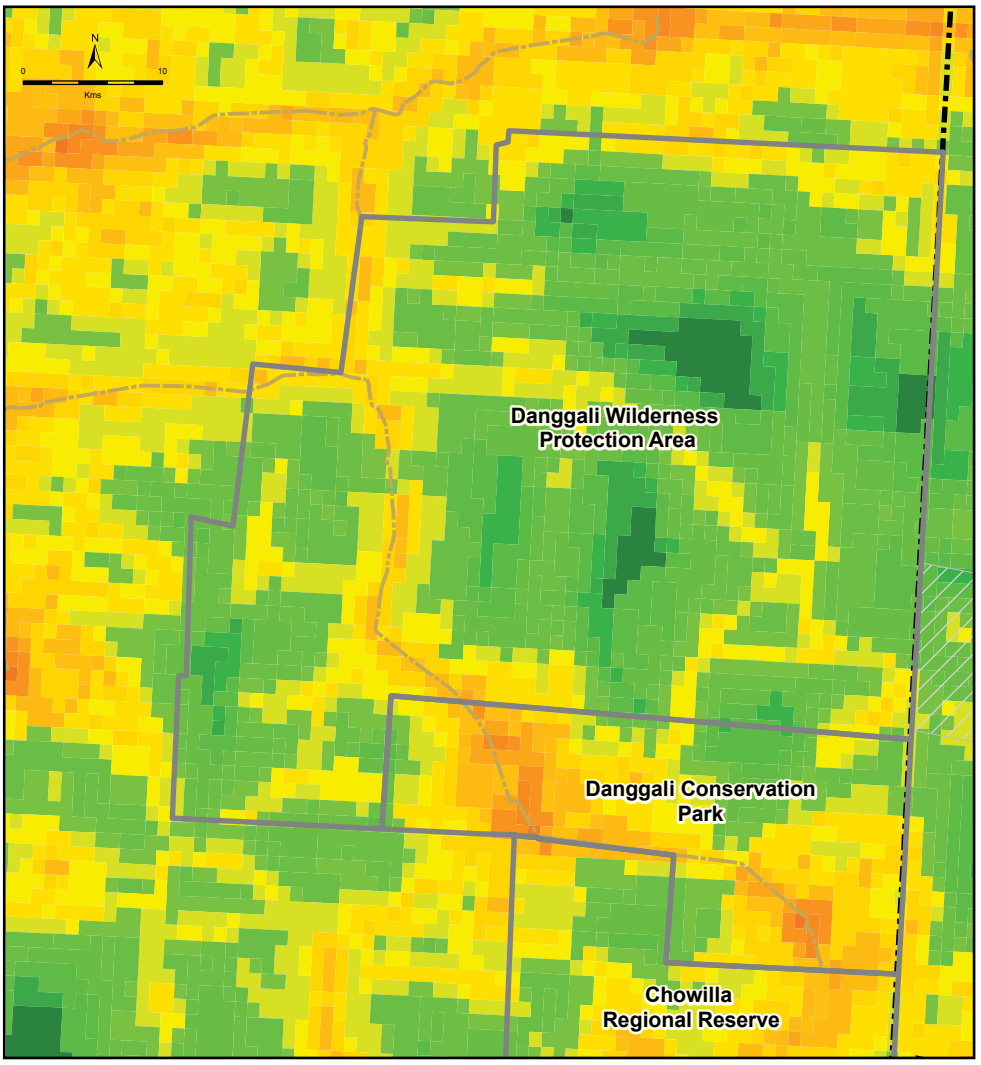

Figure 2: National Wilderness Inventory Values.

The management of wilderness protection areas in South Australia is administered under the *Wilderness Protection Act 1992*. Under the Act, the Code of Management for Wilderness Protection Areas and Zones South Australia (DEH, 2004) provides clear guidelines for the protection, enhancement and management of wilderness areas.

All management operations implemented within the Danggali Wilderness Protection Area must be consistent with the provisions of this code.

Although not a statutory requirement, the future management of Danggali Conservation Park will closely align with the wilderness philosophy where appropriate.

Setting the management direction

The future management of Danggali Wilderness Protection Area and Danggali Conservation Park will focus on working with partners to conserve wilderness quality and deliver landscape scale biodiversity outcomes within a highly connected landscape.

Danggali landscape.

What are we protecting?

Danggali Wilderness Protection Area and Danggali Conservation Park are significant as they support:

- Large areas of high quality wilderness
- Core habitat for native wildlife, including significant bird species such as the nationally endangered Black-eared Miner *(Manorina melanotis)*, and the nationally vulnerable Malleefowl *(Leipoa ocellata)* and Regent Parrot *(Polytelis anthopeplus)*
- A rich diversity of bat species, including the nationally vulnerable Long-eared Bat *(Nyctophilus timorensis)* and the state listed rare Little Pied Bat *(Chalinolobus picatus)*
- Endemic species such as Southern Ningaui *(Ningaui yvonneae)*
- Rare reptiles including the Bardick *(Echiopsis curta)* and Olive Snake Lizard *(Delma inonarta)*
- Important flora species such as the nationally threatened Slender Bell-fruit *(Codonocarpus pyramidalis)* and state endangered Black Cotton-bush *(Maireana decalvans)*
- Canegrass *(Eragrostis australasica)* tussock grassland, a poorly conserved vegetation community in South Australia
- Historic and cultural features associated with European and Indigenous occupation of the region.

What are the challenges?

Challenges to the future management of Danggali Wilderness Protection Area and Danggali Conservation Park include:

- Excessive total grazing pressure caused by feral goats and rabbits
- Predation pressure from introduced foxes and cats
- Inappropriate fire regimes, including large bushfires
- Increased frequency and intensity of drought conditions, as a consequence of climate change
- Genetic pollution within threatened wildlife populations (specifically Black-eared Miners interbreeding with Yellow-throated Miners)
- Poaching of native birds and reptiles, including some species of conservation significance
- Limited data availability to inform decision making processes.

Key management issues identified for these reserves have been grouped into four management themes:

- Conserving mallee biodiversity at a landscape scale
- Managing predation and total grazing pressure
- Managing the impacts of fire
- Providing sustainable visitor experiences.

Striated Grasswren.

Management themes and priorities

This section of the plan discusses the important issues within each theme and sets out objectives and strategies for management

Theme 1: Conserving mallee biodiversity at a landscape scale

The vast areas of relatively intact mallee vegetation protected within Danggali Wilderness Protection Area and Danggali Conservation Park support a diverse range of native flora and fauna species, including many of national conservation significance. The highly connected vegetation is particularly significant in providing core habitat for threatened and declining species such as Malleefowl *(Leipoa ocellata)* and Black-eared Miner *(Manorina melanotis)*.

The reserves also provide an important regional reference point for understanding the impacts of various disturbance regimes on local native vegetation. Ongoing photopoint monitoring within the reserves has been used to assess vegetation recovery for comparison with neighbouring properties, specifically Calperum Station (de-stocked) and Chowilla Regional Reserve (grazed).

Although this extensive habitat area provides a buffer against the pressure of large-scale processes such as climate change, localised factors such as inappropriate fire regimes, uncontrolled wildfire, predation and total grazing pressure continue to threaten the long-term viability of some species. A holistic approach to biodiversity management is required to assist species and ecosystems within the reserves and surrounding landscape to survive, evolve and adapt to changing environmental conditions.

Such management of entire ecological communities and broad habitat areas will ensure threat abatement is achieved at appropriate scales, species are managed as meta-populations and habitat connectivity and ecological processes are restored. This landscape scale biodiversity management concept provides the underlying philosophy for the future management of the reserves.

Critical to this approach is the need for sound scientific evidence to inform management decisions. At the current time, data limitations present a significant challenge to developing effective biodiversity management strategies for the reserves. The exact impact, extent and consequence of threatening processes are not comprehensively understood, therefore the establishment of well designed research and monitoring programs is needed to improve our understanding and ultimately inform effective threat abatement programs. Some research and monitoring is already occurring within the reserves, but there is still much to learn.

Development of biodiversity planning and monitoring programs across the tri-state mallee area, with a focus on the identification and management of threatened and declining species habitat will be a future priority. The development of models which identify potential high quality habitat, and monitoring of future management actions could be used to improve understanding of optimal habitat management.

This work would be based on existing monitoring implemented under specific species recovery plans and research programs, with a key focus to obtain agreement between partners on core principles for monitoring. A well designed program would allow the effectiveness of management actions to be reviewed and improved using an adaptive management approach.

A further critical element of the landscape scale management approach is the need for collaborative partnerships. Continued development and maintenance of working relationships with existing and new partners will become a key management focus into the future. The reserves are centrally located within a group of properties managed for predominately conservation purposes, including Chowilla Regional Reserve and Calperum Station to the south, and Belmore Station, Tarawi Nature Reserve and Scotia Sanctuary to the east in New South Wales. At this local level, the development of strong partnership arrangements with these land managers, neighbouring pastoral lessees and regional natural resource management organisations will be crucial.

An opportunity also exists to improve the level of strategic direction and support provided to volunteer and other groups working on projects within the reserves. Important partners include the Friends of Riverland Parks and the Department for Correctional Services who manage the Mobile Outback Work Group (MOW Camp) program within the reserves.

Within the broader landscape, the Department is a key contributor to tri-state networks such as the Murray Mallee Partnership. The Department seeks to maintain and build this partnership into the future, as this alliance will provide a key driving force for broad-scale action.

This new approach signals an important shift towards a predominantly biodiversity and wilderness management focus. Given the location and ecological significance of the reserves, the Department is well positioned to provide a stronger leadership role for nature conservation in the tri-state region.

Objectives and Strategies

Enhance the long-term survival prospects of threatened and declining species through implementation of an adaptive, landscape scale biodiversity management approach

- Continue to work with partners and foster new partnerships to develop and implement landscape scale biodiversity conservation planning, research, monitoring and threat abatement programs including:
    - Providing leadership and support to established tri-state networks
    - Aligning conservation objectives and strategies with neighbouring conservation organisations
    - Establishing agreed landscape scale conservation benchmarks
    - Identifying priority biodiversity assets to inform threat abatement programs
    - Establishing priorities for baseline and long-term biodiversity monitoring programs, with a focus on adaptive management
    - Continuing to implement relevant threatened species recovery plan actions
- Provide strategic advice, direction and support to volunteer groups
- Establish methods for effectively communicating and sharing knowledge of monitoring, research and management outcomes and opportunities

Theme 2: Managing predation and total grazing pressure

Introduced animals pose a threat to the long-term survival of some native flora and fauna species found within the reserves. Threatened and declining bird and bat species may be particularly compromised by the impacts of predation and total grazing pressure. Feral goats *(Capra hircus)* and European rabbits *(Oryctolagus cuniculus)* contribute to total grazing pressure across the reserve and surrounding landscape, with exotic sheep species also considered an emerging threat. Feral cats *(Felis catus)* and foxes *(Vulpes vulpes)* are known to prey on wildlife species.

A preliminary risk assessment of threats to mallee birds in the Murraylands Region has identified introduced grazers as a high general risk to bird species within the Riverland Biosphere (Cale and Mladovan, 2008). More specifically introduced grazers were identified as a major threat to species such as Malleefowl and Major Mitchell Cockatoo *(Lophochroa leadbeateri)*. Native plant species such as Bullock Bush *(Alectryon oleifolius ssp canescens)* and Quandong *(Santalum acuminatum)* are also known to have been heavily impacted by grazing and browsing in past years (DEH, 2005).

Rabbit and goat numbers within the reserves are currently suspected to be low, due largely to past control programs and recent dry conditions. Feral goat populations may be larger on some neighbouring properties where active management does not occur. Foxes are also likely to occur in low numbers, with little known of feral cat abundance or distribution. These pest populations may increase rapidly when seasonal conditions become favourable and even at low densities may cause unacceptable environmental impacts.

The distribution and density of feral animals in the arid zone is largely influenced by the distribution of artificial water sources such as dams and troughs. Grazing induced changes in vegetation have been associated with the presence of artificial water in many rangelands areas, as has a decline in the abundance of some native fauna species. Of significance, research on neighbouring Gluepot Reserve and Calperum Station has found a decline in the abundance of several threatened bird species near artificial water points (Harrington, 2002).

Artificial waterpoints in the form of dams are present on the reserves and improved management of these will be a future priority. Rationalisation of artificial waterpoints is a well supported strategy for reducing grazing impacts and increasing biodiversity values within arid rangelands environments (James *et al.*, 1999). As such, a staged risk assessment and rationlisation approach will be implemented which addresses biodiversity, fire management and domestic supply requirements.

It is acknowledged that the existing dams were built in landscapes with natural water holding ability. These areas are likely to have always caught and held some water for substantial periods of time, with significant use by local wildlife. It is suggested that several carefully selected dams remain in the landscape to enable continued natural fluctuations in water availability to occur. A number of dams will also be retained for fire management and domestic supply needs, with strategies such as fencing to be used to reduce grazing pressure in these areas.

Complete closure is recommended for a number of carefully selected dams to create large corridors of 'waterless' country, connecting areas of high biodiversity value. These areas would complement similar areas on neighbouring properties and assist in the protection of threatened species which rely on the availability of intact mallee.

This approach would be informed by supporting information and experience from neighbouring properties where waterpoint closure has already successfully occurred. The water holding capacity of remaining dams will be reduced by implementing strategies such as the cutting of drainage lines. Other management options may be investigated to further reduce water holding capacity over time.

A range of other management techniques have been implemented in past years to reduce total grazing pressure within the reserves. It is estimated that up to 100 000 feral goats have been removed from the reserves since 1976, using a combination of trapping and aerial control programs (DEH, 2005). Together with waterpoint rationalisation, these techniques and others such as Judas goat programs and recreational hunters may be used in future programs to reduce total grazing pressure.

As part of a holistic approach, the contribution of native species to total grazing pressure requires further investigation. Red Kangaroo *(Macropus rufus)*, Western Grey Kangaroo *(Macropus fulignosis)* and Euros *(Macropus robustus)* are known to occur within the reserves. Although these iconic native species are valued for their role in natural ecosystems, human induced changes within the broader landscape creates the potential for these native grazers to negatively impact on conservation values.

The potential for kangaroos to become over-populated and subsequently create negative impacts is supported by observations in other reserves within the region. This is particularly evident on neighbouring Chowilla Regional Reserve where high numbers of kangaroos contribute to the degradation of native vegetation (DENR, 1995).

If future research and monitoring determines that an over-population of kangaroos is impacting negatively on identified conservation values within Danggali Wilderness Protection Area and/or Danggali Conservation Park, kangaroo control programs may be implemented using a variety of methods. This may include commercial harvesting where this does not compromise wilderness values. Based on an assessment of all available population control methods, culling will only be conducted if it is considered the only practicable option.

Predation is another potentially significant threat to identified biodiversity values. Best practice management techniques for the control of predator species may be implemented to assist the recovery of defined conservation values, where a high priority need can be demonstrated. Importantly, complementary predator control programs will be considered where rabbit control is undertaken to minimise secondary predation pressure on native species. Similarly, rabbit control will be considered to reduce potential increases in grazing pressure where predator control occurs.

A lack of comprehensive scientific data is a significant barrier to implementing effective pest management programs within the reserves. Ultimately, pest control programs which are not based on sound scientific data have the potential to cause unforeseen impacts within the ecosystem and/or result in limited net benefit for the environment. Despite these constraints, the consequences of no action on the long term survival of some species may be greater.

An adaptive management approach is needed to ensure that scientifically sound management actions are implemented, then reviewed and improved as more information becomes available. Future monitoring and control programs will aim to deliver measurable outcomes for high priority biodiversity assets or other defined conservation benchmarks. These priorities will be defined in collaboration with partner organisations and technical experts as the programs are developed.

Partnerships with the South Australian Pastoral Board, neighbouring pastoral lessees and land managers will be fundamental in reducing the density and distribution of pest species within the reserves and surrounding landscape scale. Educating land managers on the impacts of pest species and best practice management techniques will be central to this strategy.

Objectives and Strategies

Assist the recovery of identified conservation priorities by reducing predation and total grazing pressure

- Design and implement an adaptive predation and total grazing pressure management (including kangaroo management) work program which addresses specific ecological requirements, conservation outcomes and monitoring needs. This will include:
    - Assessment and staged rationalisation of existing artificial waterpoints
    - Planning and implementation at a landscape scale, in collaboration with relevant partners
    - Empowering and educating neighbouring land managers to improve feral animal management practices

Theme 3: Managing the impacts of fire

Fire is an important natural process within mallee ecosystems. It has shaped the landscape for thousands of years, with many native flora and fauna species evolving to adapt or even depend on fire for survival. Despite this close connection, inappropriate fire regimes present a significant threat to biodiversity. Bushfire also poses a danger to life and property.

The Danggali reserves have a history of low fire frequency, with most fires ignited naturally during summer lightning events. The largest recorded fire in the area occurred in 1985, fuelled by a mass speargrass germination event (DEH, 2009). The fire burnt approximately 24% of the total reserves area. More recently a fire burnt over 1200 hectares of vegetation during 2006, with many smaller fires occurring since the 1990s.

Large fires have also occurred on neighbouring properties in recent times, with 118 000 hectares burnt on Calperum, Taylorville and Gluepot in 2006. Less is known of fire history prior to European settlement. A shift in land use from pastoralism to conservation during the past thirty years has seen an increase in available fuel load within the reserves; however no direct links have been made to increased fire frequency or extent (DEH, 2009).

The potential for bushfires to devastate threatened and declining species populations within the reserves is a major concern. The Black-eared Miner is one species particularly susceptible to catastrophic population declines in the event of bushfires. Old-growth mallee (older than 40 years) provides core habitat for a range of significant species including the Black-eared Miner and Malleefowl, therefore is a high priority for protection against fire (DEH, 2009).

Understanding the ecological tolerances of native flora and fauna to fire regimes is essential to ensure their long-term conservation. Effective management will consider the impacts of fire regimes on the habitats and the species they contain and how robust these habitats and species are to variation in fire regime.

The *Bookmark Mallee Fire Management Plan 2009-2019* has been developed to provide detailed strategies for fire management across the broader landscape. The plan outlines specific fire management zones for the protection of infrastructure and conservation values. Implementation of the strategies outlined in the plan has been the focus of recent fire management activities within the reserves and will continue to provide guidance for future on-ground actions.

Future strategies will include implementation of low-impact pre-suppression and suppression fire activities, restricting the extent of non-prescribed fire to protect old-growth mallee for the conservation of threatened and declining species, providing and maintaining infrastructure which supports implementation of the fire management plan and monitoring. The establishment of partnerships with interstate agencies is also a priority, to ensure a broader landscape scale approach to fire management is achieved across the mallee.

Fire management activities within Danggali Wilderness Protection Area require compliance with guidelines specified in the *Wilderness Code of Management*. Where possible, the code requires the use of fire suppression methods which will have the least long-term impact on wilderness quality (e.g. minimum impact suppression). The South Australian Wilderness Advisory Committee has endorsed the fire management plan for this area.

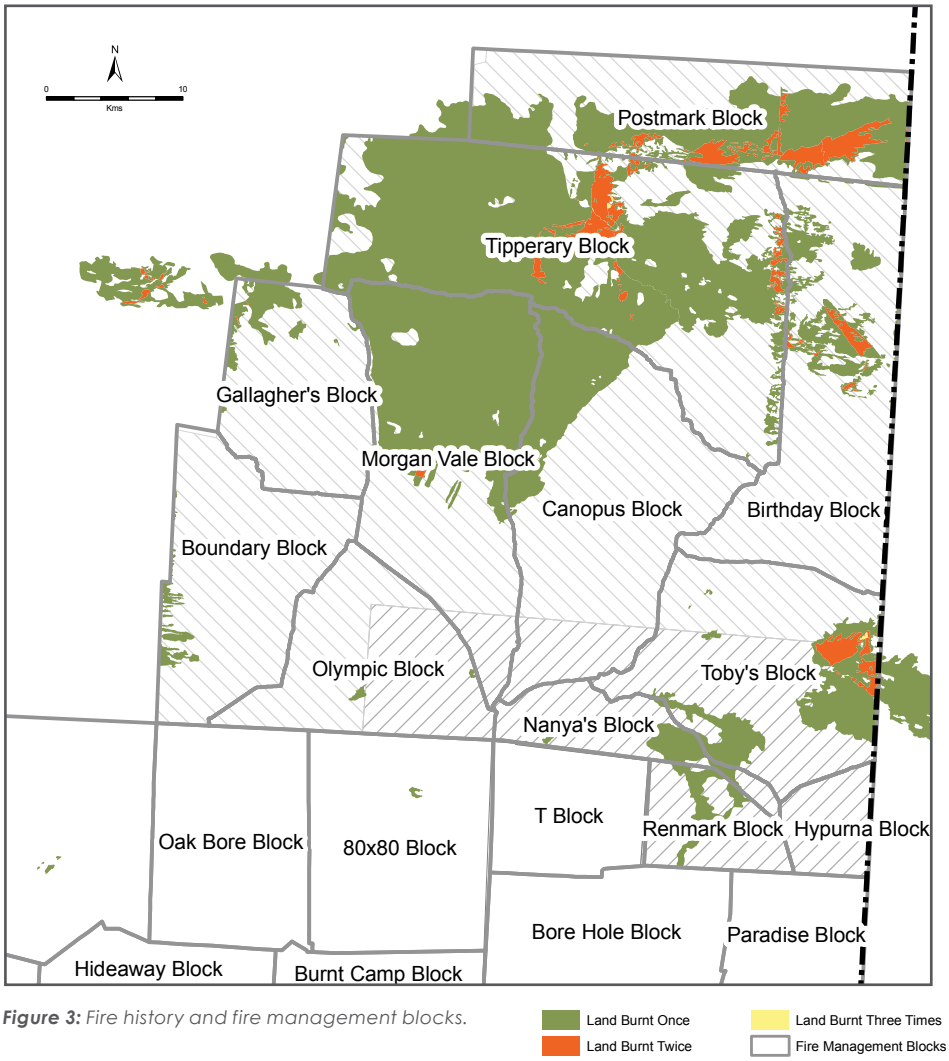

Figure 3: *Fire history and fire management blocks.*

Objectives and Strategies

Manage fire to ensure the protection of life, natural, cultural and built assets, and improve our understanding of the role of fire in mallee ecosystem

- Continue implementation of the objectives and strategies outlined in the Bookmark Fire Management Plan 2009-2019, including:
    - **Response:** Establishment of control lines/access tracks, back-burning and aerial suppression
    - **Risk modification:** Access track maintenance and prescribed burning for fuel reduction, landscape protection and/or ecological management
    - **Readiness:** Installation of water tanks and access signage, and fencing dams required for fire fighting purposes
    - **Research and information:** Monitoring, including species response to fire, influence of prescribed burning on significant species and efficacy of prescribed works in mitigating the effects of bushfire
- Maintain interstate partnerships to achieve landscape scale fire management objectives

Historic farm implement .

Theme 4: Providing sustainable visitor experiences

The following section provides the visitor management strategy for Danggali Wilderness Protection Area as required by the *Wilderness Code of Management*. This section also provides for recreational visitor access within Danggali Conservation Park.

The remote and relatively undisturbed nature of Danggali Wilderness Protection Area and Danggali Conservation Park attracts a small number of self-sufficient travellers each year, with peaks of activity occurring during the cooler months. Recreational activities such as wildlife watching, touring historical sites and bushwalking are popular with visitors seeking a remote wilderness experience.

The Tipperary and Nanya's Pad interpretative drives and the Target Mark walking trail provide an opportunity for visitors to view wildlife and enjoy solitude. Brochures which provide basic information about the reserves are also available. Camping occurs at three designated camp sites within Danggali Conservation Park, with no designated camp sites within Danggali Wilderness Protection Area.

A network of unsealed roads and tracks provides access across the reserves. Not all of these tracks are open to the public, with some used exclusively for fire and biodiversity management purposes. The existing Tipperary Drive, Nanya's Pad Drive and main Renmark to Morgan access track are the only prescribed access routes.

The reserves are generally accessed by visitors from the south (via Chowilla Regional Reserve and Renmark) or the western boundary entrance, with many entering the reserves while travelling to other destinations. This type of visitor generally does not stay overnight within the reserves.

Public use and enjoyment of wilderness areas is encouraged under the *Wilderness Code of Management*, where this is compatible with maximising wilderness quality. The current level of public access within the Danggali Wilderness Protection Area is considered compatible with the objective of maximising wilderness quality, therefore no changes are proposed to the current access arrangements.

Impacts of visitation on biodiversity values within the reserves are not comprehensively understood, but do include off-track driving, firewood collection and wildlife poaching (particularly Major Mitchell Cockatoo). Anecdotal observations indicate these impacts are likely to be minimal and localised, but further monitoring may be required.

Campfires are currently permitted outside of the fire ban season within Danggali Conservation Park. Firewood collection and the use of campfires generally is of concern from a fire risk, public safety and biodiversity conservation perspective. Fires outside the fire ban season will continue to be permitted, however if future assessments determine an unacceptable level of risk or impact on environmental values as a result of campfire use and/or firewood collection, restrictions may be imposed.

A number of old buildings provide points of interest for visitors, including the Morganvale and Canopus Homesteads. The Morganvale Homestead presents some potential risk management issues, specifically due to the deterioration of the structure. Establishing an appropriate method of risk reduction is a high priority, with management options such as repair or restricting visitor access to be considered.

The Canopus Shearer's Quarters have been made available to the public for hire in past years, but are currently unavailable as maintenance and servicing to commercial accommodation standards is not cost effective. Use of the quarters is now restricted to research groups, regional staff and other groups working on reserve projects. The Department will consider proposals from external operators regarding the future commercial use of these and other facilities on the site. In the absence of any such arrangement, the quarters will remain for the use of individuals involved in activities which directly benefit the reserves and will be at the discretion of regional management.

A small number of commercial tour operators are known to run nature-based tours in the area and an opportunity exists to develop mutually beneficial partnership arrangements with these and other commercial tour operators. The provision of exclusive access areas in return for financial or in-kind support for biodiversity management programs is one option which may be investigated.

Considerable resources have been invested into visitor management activities within the reserves historically, however in future available resources will primarily be invested into biodiversity management activities. Although public access will continue, active promotion of the reserves as a tourism destination will not occur to ensure future protection of wilderness quality, conservation values and the remote visitor experience.

Basic infrastructure which supports use of the reserves by self-reliant visitors undertaking low impact activities will continue to be provided. Strategies such as the installation of self-registration bays, appropriate signage at entry points and the provision of online interpretative information only (no printed material on-site) may be implemented to improve management efficiency without compromising the remote area visitor experience.

Objectives and Strategies

Increase awareness and appreciation of wilderness values within our community by providing unique and ecologically sustainable visitor experiences

- Provide infrastructure such as self-registration bays and interpretative signage promoting wilderness values and appropriate use protocols(where consistent with Wilderness Code of Management principles); and ensure the availability of up to date park information on the DENR website, at regional offices and visitor information centres
- Implement works to address safety issues
- Undertake compliance activities to minimise visitor impacts on biodiversity and wilderness values
- Periodically assess the risk and/or impact of camp fire use and firewood collection on environmental values, and where appropriate implement restrictions on such activities
- Consider opportunities for licensed commercial tour operators to deliver unique eco-tourism experiences
- Consider partnership arrangements with commercial operators to improve existing accommodation facilities

References

Cale, P & Mladovan, L (2008) *Threatening Processes for Mallee Birds*. Report for the South Australian Murray Darling Basin Natural Resource Management Board, Department for Environment and Heritage, Berri, South Australia.

Department for Environment and Heritage (2004) *South Australian Code of Management for Wilderness Protection Areas and Zones*. Department for Environment and Heritage, Adelaide

Department for Environment and Heritage (2005) *Wilderness Assessment Report: Proposed Danggali Wilderness Protection Area*. Department for Environment and Heritage, Adelaide

Department for Environment and Heritage (2008) *Wilderness in South Australia: Protecting Habitat, Preserving Landscapes*. Department for Environment and Heritage, Adelaide

Department for Environment and Heritage (2009) *Bookmark Mallee Fire Management Plan 2009 – 2019.* Department for Environment and DEGage, Adelaide

Department of Environment and Natural Resources (1995) *Chowilla Regional Reserve and Chowilla Game Reserve Management Plan*. Department for Environment and Natural Resources, Adelaide.

Harrington, R (2002) *The effects of artificial watering points on the distribution and abundance of avifauna in an arid and semi-arid mallee environment*. The University of Melbourne.

James, C.D., Llandsberg, J. and Morton, S.R. (1999) *Provision of watering points in the Australian arid zone: a review of effects on biota*. Journal of Arid Environments 41: 87-121

For further information please contact:

Department of Environment and Natural Resources Phone Information Line (08) 8204 1910, or see SA White Pages for your local Department of Environment and Natural Resources office. Online information available at: www.environment.sa.gov.au

Permissive Licence

Disclaimer

Published October 2011 | ISBN: 978-1-921800-29-0 | FIS: 91158